2

15th

No Duplicates
here

XI.—NOTES ON THE ANIMAL PLANKTON FROM H.M.S. 'RESEARCH.'

By Thomas Scott, F.L.S.

This collection, which consisted of twenty-four tow-net gatherings, was contained in twenty-two small bottles: all the gatherings (with one exception) were collected at the surface of the water, in the Shetland-Faröe Channel, at the end of July and the beginning of August last year, by H.M.S. 'Research.' The collections were made by a tow-net made of fine silk bolting-cloth.

Detailed Description of the Collection.

1. This gathering consisted of the contents of one haul of the tow-net, collected at the surface at 'Jackal Station No. II.,' lat. 61°45′N. long. 0°59′W., on July 30th, 1896, at 10 a.m. (net down 15 minutes). The total contents were equal to about 9 c.c., of which 0·75 c.c. consisted of flocculent matter (Diatoms, Infusoria, *Ceratium*, etc.), the remainder being composed of larger organisms, chiefly Entomostraca. The plant plankton has been described by Professor Cleve (p. 297). The following organisms were observed by me:—

Calanus finmarchicus (Gunner).
Pseudocalanus elongatus, Boeck.
Temora longicornis (Müller).
Acartia Clausii, Giesbrecht.
Oithona (?) *similis*, Claus.
Podon intermedius, Lilljeborg.

The number of Entomostraca in this gathering was, approximately, about 3500, and for every 26 *Calani* there were about 6 *Pseudocalani*, 32 *Temoræ*, and 200 *Acartiæ*, while *Oithona* and *Podon* were very rare.

2. This gathering consisted of the contents of one haul of the tow-net, collected at the surface, at the same station as above, and on the same date, at 1 p.m. (net down 15 minutes). The total contents measured 8·75 c.c, of which about ·75 c.c. consisted of flocculent matter. The following organisms were observed:—

Calanus finmarchicus (Gunner).
Pseudocalanus elongatus, Boeck.
Centropages typicus, Kröyer.
Temora longicornis (Müller).
Eucalanus elongatus (Dana).
Acartia Clausii, Giesbrecht.
Oithona (?) *similis*, Claus.
Podon intermedius, Lilljeborg.
Parathemisto (?) *gracilipes*, Norman.
Limacina retroversa (Fleming).

The number of Entomostraca in this gathering was about the same as the last, and the proportion of the species was also similar. There were only one or two specimens of *Parathemisto* and of *Centropages*, and one specimen of *Eucalanus*. *Limacina* was very rare.

3. This gathering consisted of the contents of one haul of the tow-net, collected at the surface, at the same station as the other two, and on the same date, at 3 p.m. (net down 15 minutes).

The total contents of this haul measured 10 c.c., about 1 c.c. consisting of flocculent matter. The following organisms were observed in this gathering:—

Calanus finmarchicus (Gunner).
Pseudocalanus elongatus, Boeck.
Euchæta norvegica, Boeck.
Temora longicornis (Müller).
Acartia Clausii, Giesbrecht.
Oithona (?) *similis*, Claus.
Podon intermedius, Lilljeborg.
Parathemisto (?) *gracilipes*, Norman.

The number of Entomostraca was, approximately, about 4000, and the proportions of the species, the one to the other, nearly as in the formula—

Calanus,	*Pseudocalanus,*	*Temora,*	*Acartia,*	*Oithona,*	*Podon.*
50	7	24	180	12	2

There were two specimens of *Euchæta* and one of *Parathemisto.* Besides the usual Diatomacea, Infusoria, and Radiolaria, there were a few specimens of *Globigerina* in this gathering.

4. This gathering consisted of one haul of the tow-net, collected at the surface, at 'Jackal Station No. XIII.,' lat. 61°1′ N. long. 3°12′ W., on July 31st, 1896, at 10 a.m. (net down 15 minutes).

The total contents of this haul measured about 10·5 c.c., including about ·5 c.c. of flocculent matter. The following organisms were observed in this gathering :—

Calanus finmarchicus (Gunner).
Pseudocalanus elongatus, Boeck.
Temora longicornis (Müller).
Acartia Clausii, Giesbrecht.
Oithona (?) *similis,* Claus.
Podon intermedius, Lilljeborg.
Parathemisto gracilipes, Norman.
Limacina retroversa (Fleming).

The number of the Entomostraca was about 4500, and the proportional numbers of the species nearly as in the last gathering. *Limacina* was very rare.

5. This gathering consisted of one haul of the tow-net, collected at the same station, and on the same date as the last, at 11.30 a.m. (net down 15 minutes).

The total contents of this haul measured about 11·5 c.c., including about 0·5 c.c. of flocculent matter. The following were the organisms observed :—

Calanus finmarchicus (Gunner).
Pseudocalanus elongatus, Boeck.
Temora longicornis (Müller).
Centropages typicus, Kröyer.
Acartia Clausii, Giesbrecht.
Oithona (?) *similis,* Claus.
Podon intermedius, Lilljeborg.
Parathemisto (?) *gracilipes,* Norman.

The total number of Entomostraca was about 5000, the proportional numbers of the species being somewhat similar to those of previous gatherings.

6. This gathering consisted of one haul of the tow-net, collected at the surface, at the same station as Nos. 4 and 5, and at the same date, at 2 p.m. (net down 15 minutes).

The total contents of this haul measured about 12·5 c.c., 1·5 c.c. of which consisted of flocculent matter. The following are the organisms observed in this gathering :—

Calanus finmarchicus (Gunner).
Pseudocalanus elongatus, Boeck.
Temora longicornis (Müller).
Acartia Clausii, Giesbrecht.
Oithona (?) *similis,* Claus.
Podon intermedius, Lilljeborg.
Evadne Nordmanni, Lovén.
Parathemisto (?) *gracilipes,* Norman.
Limacina retroversa (Fleming).
Sagitta.
Globigerina.

The total number of Entomostraca and the proportional numbers of the different species were similar to the last.

7, 8. These two small gatherings were put together in the same bottle : they consisted of the contents of two hauls of the tow-net, collected at the surface, at 'Knight Errant Station No. 33,' lat. 60°3′ N. long. 5°51′ W. at 10 a.m. and noon on August 1st, 1896 (net down 15 minutes each time).

The total contents of the two hauls measured about 13 c.c., but about half of this quantity consisted of flocculent matter, the other half being made up of Entomostraca and *Salpæ*. The following are the organisms observed :—

Calanus finmarchicus (Gunner).
Eucalanus crassus, Giesbrecht.
Pseudocalanus elongatus, Boeck.
Temora longicornis (Müller).
Metridia hibernica (Brady and Robertson).
Acartia Clausii, Giesbrecht.
Oithona (?) *similis*, Claus.
Ectinosoma atlanticum (Brady and Robertson).
Podon intermedius, Lilljeborg.
Salpa (?) *vulgaris*.
Paracalanus parvus, Claus.

Calanus and *Pseudocalanus* were scarce, *Acartia* was frequent, *Salpa* was also frequent, but all the others were more or less rare.

9, 10. These two gatherings were put together in the same bottle: they consisted of the contents of two hauls with the tow-net, at the surface of the water, at the same station as the last, and collected on the same date, at 2 p.m. and 4 p.m. (the net being down for 15 minutes each haul).

The total contents of the two hauls measured only about 5 c.c., and consisted chiefly of *Salpa* and some flocculent matter. Entomostraca were scarce, only five species being observed, of which the following are the names :—

Calanus finmarchicus (Gunner), rare.
Pseudocalanus elongatus, Boeck, few.
Acartia Clausii, Giesbrecht, few.
Oithona (?) *similis*, Claus, few.
Podon intermedius, Lilljeborg, few.
Salpa (?) *vulgaris*, frequent.
(?) *Arachnactis*, sp., rare.
Ctenophora, rare.

11, 12. These two gatherings were put together in the same bottle: they consisted of the contents of two hauls with the tow-net, at the surface of the water, at the same station as the last; they were collected at 2 p.m. and 3.30 p.m. on August 2nd, 1896 (the net being down 15 minutes each haul).

The total contents of these two hauls measured about 11 c.c., including about 1 c.c. of flocculent matter. The Entomostraca numbered, approximately, about 4000. The following are the names of the organisms observed :—

Calanus finmarchicus (Gunner).
Eucalanus elongatus (Dana).
Aëtidius armatus, Brady.
Euchæta norvegica, Boeck.
Metridia hibernica (Brady and Robertson).
Podon intermedius, Lilljeborg.
Limacina retroversa (Fleming).
Sagitta.
Tomopteris.
Ctenophora.

The formula shows the proportional numbers nearly—

Calanus,	*Pseudocalanus*,	*Metridia*,	*Podon.*
90	6	50	40

The others were more or less rare.

13. This gathering consisted of one haul of the tow-net, at the same 'Knight Errant Station' as the last, collected at the surface at 10 a.m. on August 3rd, 1896 (the net being towed for 15 minutes).

The total contents of the haul measured about 9 c.c., and consisted mostly of flocculent matter: several species of Entomostraca were observed, but individuals were few or rare. *Acartia Clausii* was of more frequent occurrence than any of the others.

The following are the species that have been observed :—

Calanus finmarchicus (Gunner), rare.
Pseudocalanus elongatus, Boeck, one.
Paracalanus parvus (Claus), two.
Centropages typicus, Kröyer, one.
Acartia Clausii, Giesbrecht, frequent.
Evadne Nordmanni, Lovén, few.
Ctenophora, frequent.
(?) *Arachnactis.*

14. This gathering consisted of one haul of the tow-net, at the same station, and on the same date, as No. 13 : it was collected at the surface at 2 p.m. (the net being towed for 15 minutes).

This gathering only measured about 5 c.c., including 1 c.c. of flocculent matter.

Calanus finmarchicus (Gunner), few.
Pseudocalanus elongatus, Boeck, rare.
Centropages typicus, Kröyer, one.
Temora longicornis (Müller), rare.
Acartia Clausii, Giesbrecht, frequent.
Oithona (?) *similis*, Claus, rare.
Podon intermedius, Lilljeborg, rare.
Evadne Nordmanni, Lovén, rare.
Globigerina.
(?) *Arachnactis.*

There were also a few Ctenophora and larval Crustacea, as well as one or two young Gasteropod molluscs.

15. This gathering consisted of one haul with the tow-net at 'Jackal Station No. XIV.,' lat. 61°20′N. long. 4°22′W., taken at 11 a.m. on the 4th of August 1896, at the surface of the water (the net being towed for 15 minutes).

The gathering measured about 16·5 c.c., 1·5 c.c. of which consisted of flocculent matter, the remaining 15 c.c. being mostly Copepoda. The number of Copepods in the gathering would be approximately about 5000, the greater part consisting of *Calanus finmarchicus.* Other species (the names of which are given below) were rare :—

Calanus finmarchicus (Gunner).
Paracalanus parvus (Claus).
Temora longicornis (Müller).
Euchæta norvegicus, Boeck.
Acartia Clausii, Giesbrecht.
Oithona (?) *similis*, Claus.
Globigerina, rare.

16. This gathering consisted of one haul with the tow-net at the same station as No. 15 : it was collected at the surface at 2 p.m. on the 4th August (the net being towed for 15 minutes).

This was comparatively a small gathering : it measured about 5 c.c., including 2·5 of flocculent matter. The number of Copepoda in the gathering was about 1500. *Calanus finmarchicus* was more common than any of the others, as shown by the formula—

Calanus,	*Pseudocalanus,*	*Acartia,*	*Oithona,*	*Podon.*
160	4	60	9	17

Names of the species :—

Calanus finmarchicus (Gunner).
Pseudocalanus elongatus, Boeck.
Metridia hibernica (Brady and Robertson), two.
Acartia Clausii, Giesbrecht.
Oithona (?) *similis*, Claus.
Podon intermedius, Lilljeborg.
Evadne Nordmanni, Lovén, one.

17. This gathering, which was contained in two bottles, consisted of one haul with the tow-net at the same station, and on the same date, as Nos. 15 and 16 : it was collected at 8 to 12 feet below the surface of the water, at 4 p.m. (the net, in this experiment, was only towed for 10 minutes).

This gathering, which was considerably larger than any of the others, measured about 96 c.c., nearly 89 c.c. of this consisting entirely of *Calanus finmarchicus*, which was the only Entomostracan observed in this gathering. The number of *Calanus* would be, approximately, about 30,000. The remaining portion of the gathering consisted of *Ctenophora* (rare), Diatomacea, Infusoria, and Radiolaria.

18. This gathering consisted of one haul of the tow-net at the same station as No. 17, and on the same date: it was collected at 9 p.m., at the surface of the water (the net being towed for 15 minutes).

The total contents of this gathering measured 65 c.c., and consisted chiefly of *Calanus*. A few other species were observed, but these were of more or less rare occurrence. The number of Copepoda in this gathering would be, approximately, about 22,000. The following are the names of all the species observed:—

Calanus finmarchicus (Gunner).
Pseudocalanus elongatus, Boeck.
Temora longicornis (Müller).
Euchœta norvegica, Boeck.
Acartia Clausii, Giesbrecht.
Parathemisto (?) *gracilipes*, Norman.
Sagitta.
Ctenophora.
Larval decapod Crustacea, rare.

19. This gathering consisted of one haul of the tow-net at 'Jackal Station No. XVII.': it was collected at the surface of the water at 10 a.m. the 5th of August 1896 (the net being towed for 15 minutes).

This gathering measured about 10·5 c.c., the larger portion of which consisted of *Calanus*. The only other species observed were *Pseudocalanus elongatus* and *Acartia Clausii*, both of which were rare. The number of Copepoda in this gathering was, approximately, 3500.

20. This gathering consisted of one haul of the tow-net at the same station as No. 19, and at the same date: it was collected at the surface at 2 p.m. (the net being towed for 15 minutes).

The contents of the tow-net measured about 14·5 c.c., about a fourth part consisting of Radiolaria, Infusoria, and Diatomacea. The Entomostraca, which numbered about 3600, consisted chiefly of *Calanus*; the other species that were observed were all of more or less rare occurrence. Their names are as follows:—

Calanus finmarchicus (Gunner).
Pseudocalanus elongatus, Boeck.
Temora longicornis (Müller).
Metridia hibernica (Brady and Robertson).
Acartia Clausii, Giesbrecht.
Parathemisto (?) *gracilipes*, Norman.

also a few Ctenophora and larval Crustacea.

21. This gathering consisted of one haul of the tow-net at the same station, and on the same date, as the last: it was collected at 3.30 p.m., and was a surface gathering (the net was towed 15 minutes).

The contents of the tow-net measured 23 c.c., including about 1·5 c.c. of diatomaceous matter. The remaining 21·5 c.c. consisted almost entirely of Entomostraca, chiefly *Calanus*. The following are the names of the species observed, all of which, with the exception of *Calanus*, were more or less rare:—

Calanus finmarchicus (Gunner).
Eucalanus elongatus (Dana), one.
Pseudocalanus elongatus, Boeck, very rare.
Temora longicornis (Müller), very rare.
Acartia Clausii, Giesbrecht, rare.
Oithona (?) *similis*, Claus, very rare.
Evadne Nordmanni, Lovén, rare.
Microniscus calani, G.O. Sars, three.
(?) *Clavelina*, one small group.

22. This gathering consisted of one haul of the tow-net at 'Knight Errant Station No. 28,' lat. 60°2′ N. long. 7°11′ W., taken on August 6th, at 11.30 a.m. It was a surface gathering, and the time the net was towed was 15 minutes.

The gathering measured about 10·5 c.c., 3 c.c. of which consisted of flocculent matter: the remainder consisted chiefly of Entomostraca, and numbered, approximately, about 3000. The names of the species observed are:—

Calanus finmarchicus (Gunner).
Paracalanus parvus (Claus).
Temora longicornis (Müller).
Acartia Clausii, Giesbrecht.
Oithona (?) *similis*, Claus.
Podon intermedius, Lilljeborg.
Parathemisto (?) *gracilipes*, Norman.
Limacina retroversa (Fleming).
Globigerina, Ctenophora, *Evadne Nordmanni*, Lovén.

In 626 specimens, the following proportions were found:—

Calanus,	*Paracalanus*,	*Temora*,	*Acartia*,	*Oithona*,	*Podon*,	*Evadne*.
310	1	46	146	7	15	1

23. This gathering consisted of one haul of the tow-net at the same station, and on the same date, as the last: it was a surface gathering, and was collected at 6 p.m. (the net being towed for 15 minutes).

The contents of this gathering measured about 7·5 c.c., and contained a considerable number of *Salpæ*. Though several species of Entomostraca were observed, individuals were few in number. *Acartia Clausii* was more frequent than any of the others. The following are the names of the species observed:—

Eucalanus elongatus (Dana) one.
Paracalanus parvus (Claus), one.
Pseudocalanus elongatus, Boeck, three.
Metridia hibernica (Brady and Robertson), several.
Scolocithrix abyssalis, Giesbrecht, one or two.
Euchæta norvegica, Boeck, five or six.
Acartia Clausii, Giesbrecht, frequent.
Podon intermedius, Lilljeborg, frequent.
Salpa (?) *vulgaris*, frequent.
Diphys (?) *campanulifera*, rare.
Ctenophora, rare.

24. This gathering consisted of one haul of the tow-net at the same station, and on the same date, as Nos. 22 and 23: like the others it was a surface gathering, and was collected at 8 p.m. (the net being towed 15 minutes).

This gathering, which consisted chiefly of Ctenophora and *Salpa*, measured about 7·5 c.c. Entomostraca were comparatively few in number. The following are the names of the species observed:—

Calanus finmarchicus (Gunner), frequent.
Eucalanus elongatus (Dana), one.
Paracalanus parvus (Claus), one or two.
Pseudocalanus elongatus, Boeck, rare.
Temora longicornis (Müller), one.
Metridia hibernica (Brady and Robertson), two.
Acartia Clausii, Giesbrecht, frequent.
Oithona (?) *similis*, Claus, few.
Podon intermedius, Lilljeborg, frequent.
Evadne Nordmanni, Lovén, rare.
Sergestes (?) *atlanticus*, M. Edw., one (jun.).
Salpa, several. (?) *Arachnactis*. (?) *Diphys*.

LIST OF THE SPECIES NAMED IN THE PRECEDING DESCRIPTION.

MACRURA.

Sergestes (?) *atlanticus,* M. Edwards.

COPEPODA.

Calanus finmarchicus (Gunner).
Eucalanus elongatus (Dana).
Paracalanus parvus (Claus).
Pseudocalanus elongatus, Boeck.
Aëtidius armatus, Brady.
Scolocithrix abyssalis, Giesbrecht.
Temora longicornis (Müller).
Mitridia hibernica (Brady and Robertson).
Euchæta norvegica, Boeck.
Centropages typicus, Kröyer.
Acartia Clausii, Giesbrecht.
Oithona (?) *similis,* Claus.
Ectinosoma atlanticum (Brady and Robertson).

CLADOCERA.

Podon intermedius, Lilljeborg.
Evadne Nordmanni, Lovén.

AMPHIPODA.

Parathemisto (?) *gracilipes,* Norman.

EPICARIDÆ.

Microniscus calani, G.O. Sars.

PTEROPODA.

Limacina retroversa (Fleming)

TUNICATA.

Salpa (?) *vulgaris.*
(?) *Clavelina.*

VERMES.

Sagitta bipunctata, G. and G.
Tomopterus onisciformis, Esch.

CŒLENTERATA.

Diphys, sp., and one or two others not identified.

NOTES ON SOME OF THE SPECIES.*

Sergestes (?) *atlanticus,* M. Edwards.—A single immature specimen of *Sergestes,* which the Rev. Mr Stebbing (who examined the specimen for me) thinks may probably belong to *S. atlanticus,* was obtained in the last of the tow-net gatherings collected by H.M.S. 'Research'; the specimen measured about 18 mm. ($\frac{3}{4}$ inch) in length. The distribution of *Sergestes atlanticus,* according to Spence Bate—see his work on the *Macrura* of the 'Challenger' Expedition—is almost world-wide; the 'Challenger' specimens were obtained in such widely divergent localities as off Japan; off Matuka, Fiji Islands; south of Australia; off Monte Video; near Teneriffe; and at 300 miles off the Chesapeake. Moreover, it was taken at the surface and also at the depth of 2425 fathoms. *Sergestes arcticus*, Kröyer, which Spence Bate considers to be identical with *S. atlanticus*, was obtained off the coast of Greenland. The length of the 'Challenger' specimens varied from 20 to 50 mm.; while, according to S. Smith, a specimen of *Sergestes arcticus*, obtained off the east coast of the United States of America, measured 90 mm. in length.

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* I am largely indebted to Dr Giesbrecht's valuable work, *Der Pelagischen Copepoden des Golfes von Neapal,* for information concerning the distribution of the Copepoda. Dr Brady's *Monograph of British Copepoda,* and various other works, have also been consulted.

Calanus finmarchicus (Gunner).—The distribution of this species is also nearly world-wide, as the following other records will show:—Arctic Ocean, North Atlantic, and European Seas (Brady); Mediterranean, West Coast of South America, Hongkong (Giesbrecht); Australasia and South Pacific (Brady); Sulu Sea (Dana).

Eucalanus elongatus (Dana).—This is clearly Dana's species; it agrees perfectly with the description and figures of it in Dr Giesbrecht's monograph on the *Copepoda of the Gulf of Naples.* This also is an apparently widely-distributed species: Dana records it from the Sulu Sea, and T. Street from north of the Celebes; Dr Claus obtained it in the Mediterranean, and Dr Giesbrecht notes its occurrence westward of Gibraltar; on the West Coast of South America, from Valparaiso northwards; and in the Pacific between lat. 3° S. and 14° N., westward to long. 132° W. But, though the species is of wide distribution, its occurrence in the Shetland-Faröe Channel is of interest, as there seems to be no previous record of its being found so far north in the Atlantic (unless perhaps, some of the North Atlantic records of *Eucalanus attenuatus*: Dana may, owing to an oversight, really refer not to that species, but to *Eucalanus elongatus*). *Eucalanus elongatus* does not yet appear to have been recorded from the North Sea, at least within the British area.

Eucalanus crassus, Giesbrecht.—Only a single specimen (a female) of this species was obtained, and it was captured at 'Knight-Errant Station No. 33.' *Eucalanus crassus* is a more robust species than either *Eu. elongatus* or *Eu. attenuatus.* The abdomen has the same number of segments as in that of the last-named species, but the genital segment is considerably shorter, and is laterally more dilated and broadly rounded: the second abdominal segment is very short. The occurrence of *Eucalanus crassus* in the Shetland-Faröe Channel is somewhat interesting, as bearing on the distribution of the species. Dr Giesbrecht records the occurrence of the species off Rio de Janeiro and north-east thereof; to the west of South America between lat. 14° and 26° S., and further between long. 175° W. and 138° E., and lat. 19° to 20 N. Moreover, while re-examining some specimens of *Eucalanus* from the Gulf of Guinea, for the purpose of comparing them with that from the Shetland-Faröe Channel, I found one of this species: this specimen was taken at a depth of 50 fathoms, lat. 70° 54′ N., long. 17° 25′ W., and the temperature of the water at the 50 fathoms was 56°·58 Fahr. The above is all that I know as regards the distribution of this *Eucalanus.* It is just possible, however, that some of the records of *Eucalanus attenuatus* may, as with *Eu. elongatus*, really refer to *Eucalanus crassus.*

Paracalanus parvus (Claus).—This is a small and widely distributed species, and readily distinguished by the structure of the fifth pair of thoracic feet in ♂ and ♀. The following is a brief summary of what is known as to its distribution :—Heligoland (Claus), North Sea (Mobins), Trieste (Claus ; Car.), Teneriffe (I. C. Thompson), West Coast of South America, Hongkong (Giesbrecht), Plymouth (Bourne), Irish Sea (I. C. Thompson), Firth of Forth (Mihi).

Pseudocalanus elongatus, Boeck.—This Copepod is usually more or less common all round the British coasts. According to Dr Giesbrecht, the known distribution of this species extends approximately from lat. 50° to 60° N., and from the Baltic to about long. 10° W.

Aëtidius armatus, Brady.—Several specimens (all female) of this species were obtained on the same date and also at the same station (' Knight-Errant Station No. 33 ') as *Eucalanus crassus*, but at a somewhat later hour of the day. The occurrence of *Aëtidius armatus* in the Shetland-Faröe Channel is, like that of *Eucalanus crassus*, of considerable interest as bearing on the distribution of the species. *Aëtidius armatus* was first described by Prof. G. S. Brady in his work on the ' Challenger ' Copepoda, where he records its occurrence in gatherings from the following places :—Indian Ocean (lat. 46° 46′ S., long. 45° 31′ E.); Torres Straits, off Port Jackson, Australia ; Chinese Sea (lat. 17° 54′ N., long. 1·7° 14′ E.) ; in lat. 32° 24′ S., long. 13° 5′ W. ; and in lat. 3° 10′ N., long. 14° 51′ W. Dr Giesbrecht, in his work on the *Copepoda of the Gulf of Naples*, records it as follows :—Gibraltar, 99°–124° W., 3° S.–11° N. Mr I. C. Thompson records it from Malta, and in my report on ' Some Entomostraca from the Gulf of Guinea, West Coast of Africa,' there are a few records of the species for that district. It may also be stated that the specimens recorded by Dr Giesbrecht were obtained at a depth of 2300 metres ; those from the Gulf of Guinea were obtained at depths varying from 5 to 460 fathoms (fully 1400 metres). The capture of *Aëtidius armatus* at this northern station is therefore of interest, as it extends greatly the limits of its distribution, and indicates that its distribution is almost world-wide. The presence of the *Aëtidius armatus* at this ' Knight-Errant ' station might of course be due to the action of oceanic currents transporting the specimen beyond the normal limits of the distribution of the species.

Scolocithrix abyssalis, Giesbrecht.—The occurrence of this species in the ' Research ' collection is of interest. In my report on some Entomostraca from the Gulf of Guinea (pub. 1894), a Copepod is described as *Scolocithrix tumida*, which appears to be identical with *Scolocithrix abyssalis*, Giesbrecht. The ' Research ' specimen agrees perfectly with the form described as *S. tumida*. The specimens from the North Pacific and the Gulf of Guinea were obtained in moderately deep water, the former from 1000 to 4000 metres, the latter from 85 to 460 fathoms ; but the ' Research ' specimen is from a surface gathering. The known distribution of this *Scolocithrix* appears to be very limited ; the only record given by Dr Giesbrecht, and referred to above, is as follows :—' 124°–132° W., 11°–14° N. ; in 1000–4000 metres, Tiefe,' and it was obtained at only two stations in the Gulf of Guinea, viz. : at about 100 miles to the west of Lonago (lat. 4° 27′ 7″ S., long. 10° 1′ 8″ E.), in 85 and 235 fathoms ; and at about the same distance west of Princes Island (1° 55′ 5″ N., 5° 55′ 5″ E.), in 460 fathoms. Its occurrence at the surface of the water at the Shetland-Faröe Channel is therefore interesting from its bearing on the distribution of the species, both horizontally and bathymetrically.

Temora longicornis (Müller).—The known distribution of this species appears to be confined to a comparatively limited area of the North Atlantic—viz., from lat. 50° to 60° N., westward to about 10° W. long. It has no doubt been recorded from the Adriatic Sea by Dr Claus, and from Marseilles by Dr Gouret; but Dr Giesbrecht, the eminent authority on the Copepoda, seems to be of the opinion that these records may not refer to this, but to some closely allied form. In my report on 'Some Entomostraca from the Gulf of Guinea, West Coast of Africa,' *Temora longicornis* is included in the list of Copepoda obtained in the collections from that district, but attention is directed to the fact that the fifth pair of thoracic feet in the male differ somewhat from the same appendages of the males of that species from the British Seas, and a figure is given on Plate IX. (fig. 13) showing the nature of the difference. I am now inclined to consider the *Temora* recorded under this name from the Gulf of Guinea to belong, not to *T. longicornis*, but to *T.* (*Calanus*) *turbinatus* (Dana)—a form closely related to the other.

Metridia hibernica (Brady and Robertson).—This species was described in 1873, in the *Annals and Magazine of Natural History*, as *Paracalanus hibernicus* by Dr Brady and Mr (afterwards Dr) Robertson; it was subsequently ascribed to *Metridia armata* of Boeck, and also to the genus *Pleuromma* of Claus. Dr Giesbrecht, in his valuable monograph on the *Copepoda of the Gulf of Naples*, has shown that, while the form discovered by Brady and Robertson is a true Metridia, it belongs to no previously described species; he therefore restores the specific name first given to it by Drs Brady and Robertson. The following is a brief summary of what is known regarding the distribution of this species, viz.: North Atlantic, from lat. 51° 22′ N., and long. 12° 25′ W. to Rockall Bank, Scilly Isles (Dr Brady). Arctic examples, apparently belonging to this species, but twice the size of British specimens, were obtained by the 'Alert' and 'Discovery' Expeditions (Dr Brady). Firth of Forth, Firth of Clyde, and Moray Firth (Mihi). Irish Sea (I. C. Thompson).

Euchæta norvegica, Boeck.—It will be noted that this Copepod has been obtained in a few of the surface tow-net gatherings; it appears, however, to be found in the greatest abundance in deep water. The distribution of *Euchæta norvegica* appears to be restricted to a somewhat limited area. Dr Mobius has obtained it off the south-west coast of Norway. Professor Sars reports it as occurring generally in the North Atlantic and Arctic Sea, between Norway, Greenland, and Iceland. It occurs abundantly in Loch Fyne, but sparingly in other parts of the Clyde estuary. The Clyde appears to be near the southern limit of its distribution. It is only within comparatively recent years that *Euchæta norvegica* has been observed in the British seas.

Centropages typicus, Kröyer.—This species is of more or less general occurrence all round the British Islands, but is somewhat restricted in its distribution. It appears to be confined to the North Atlantic, the North Sea, and the Mediterranean. The following are some of the localities from which *Centropages typicus* has been recorded, viz.: Canary Islands (I. C. Thompson); this seems to be near the southern limit of the species. Mediterranean—[Malta (I. C. Thompson); Trieste (Car), Gulf of Naples (Giesbrecht), off Nice (Claus)]. Cape Finisterre (Kröyer), West of Ireland (Brady and Robertson), Shetland Islands (Norman), Faröe Channel (Brady), south-west and south of Norway (Boeck), Heligoland (Claus), Wimereux (Canu).

Acartia Clausii, Giesbrecht.—All the specimens of *Acartia* observed belonged to the one species, viz., *A. Clausii.* This is quite a distinct form, especially as regards the structure and armature of the fifth feet, and in this respect it differs very markedly from *Acartia longiremis*, Lilljeborg. So far as known, the distribution of *Acartia Clausii* appears to be even more extensive than, though probably not so general as, *Centropages typicus.* The area of its known distribution includes the Mediterranean (Giesbrecht, Claus, Gourret, I. C. Thompson), Libreville, Gaboon River, West Africa (Mihi), Canary Islands (I. C. Thompson, Wimereux (Canu), Plymouth (Bourne), Loch Fyne, Scotland (Norman), Firth of Forth, Scotland (Mihi). The present seems to be one of the most northerly records hitherto reported for this species.

Oithona (?) *similis*, Claus.—All the 'Research' specimens of *Oithona* appear to belong to the species described by Dr Giesbrecht as *Oithona similis*, Claus. Dr Giesbrecht seems to consider that most of the British records of *Oithona spinifrons* are referable to this species, and he is satisfied that *Oithona spinirostris*, Giesbrecht, is also identical with it. The authentic distribution of *Oithona similis* is limited to a comparatively few places; as, for example, Nice, Trieste, and Gulf of Naples in the Mediterranean (Claus, Car, Giesbrecht), Kieler Fohrde (Giesbrecht), Bay of Wismar, Baltic (Braun), West Baltic (Hensen), the Indian and Pacific Oceans (Giesbrecht).

Ectinosoma atlantica (Brady and Robertson).—This minute species has to all appearance a world-wide distribution. Besides the various records of its occurrence around the British Islands, it has also been reported from the North and South Atlantic and the Pacific Oceans (the Gulf of Guinea, West Coast of Africa, near Ascension Island; and near the Galapagos Island). *Ectinosoma atlantica* is so minute that it has doubtless often escaped observation: it is sometimes a moderately common species in Loch Fyne.

Podon intermedius, Lilljeborg.—All the specimens of *Podon* observed belonged to this species, which is readily distinguished from *P. polyphemoides* by the number of hairs of the second antenna—one branch having seven and the other six hairs.

Parathemisto (?) *gracilipes*, Norman.—None of the specimens of *Parathemisto* obtained appeared to be mature, but, as far as could be made out, they all belonged to *P. gracilipes*, which is a smaller species than *P. oblivia.*

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